

10/774,619  
2-904

What is Claimed is:

1. A chemical compound, comprising the general formula  $L\{YX_m\}_n$   
wherein:

X is selected from the Group 13 elements consisting of boron,  
aluminum, gallium, indium, and tellurium;

5 Y is selected from the halide group consisting of fluorine,  
chlorine, bromine, iodine, and astatine;

L is a chelating ligand containing at least one binding atom  
contacting the Group 13 element, the atom being selected from the group  
consisting of C, N, O, and S; and

10 m and n are integers having a value of at least 1.

2. A chemical compound, comprising the general formula  $L\{YX_m\}_n$   
wherein:

L is a Schiff base-containing ligand;

5 X is selected from the Group 13 elements consisting of boron,  
aluminum, gallium, indium, and tellurium;

Y is selected from the halide group consisting of fluorine,  
chlorine, bromine, iodine, and astatine; and

m and n are integers having a value of at least 1.

3. The chemical compound of claim 2, wherein L is a salen ligand.

4. The chemical compound of claim 2, wherein L is a bidentate ligand.
5. The chemical compound of claim 2, wherein L is a quadridentate ligand.
6. The chemical compound of claim 3, wherein L is selected from the group consisting of Salen ('Bu), Salpen ('Bu), Salben ('Bu), and Salhen ('Bu).
7. The chemical compound of claim 2, wherein Y is boron or aluminum.
8. The chemical compound of claim 2, wherein X is chlorine, bromine, or iodine.
9. The chemical compound of claim 2, wherein m and n are 2.
10. A method for dealkylation of a phosphate ester or an ether, comprising contacting the phosphate ester or ether with a compound comprising the general formula  $L\{YX_m\}_n$  wherein:
  - 5 L is a Schiff base-containing ligand;
  - X is selected from the group consisting of boron, aluminum, gallium, indium, and tellurium;
  - Y is selected from the halide group consisting of fluorine, chlorine, bromine, iodine, and astatine; and

m and n are integers having a value of at least 1.

11. The method of claim 10, wherein L is a salen ligand.
12. The method of claim 10, wherein L is a bidentate ligand.
13. The method of claim 10, wherein L is a quadridentate ligand.
14. The method of claim 10, wherein L is selected from the group consisting of Salen ('Bu), Salpen ('Bu), Salben ('Bu), and Salhen ('Bu).
15. The method of claim 10, wherein Y is boron or aluminum.
16. The method of claim 10, wherein X is chlorine, bromine, or iodine.
17. The method of claim 12, wherein m and n are 2.
18. A catalytic method for dealkylation of a phosphate ester or an ether, comprising contacting the phosphate ester or ether with the compound of claim 2 in the presence of  $BBr_3$ .
19. The method of claim 18, wherein the phosphate ester or ether and  $BBr_3$ , are added in equimolar amounts.

20. The method of claim 18, wherein the dealkylation is conducted at ambient temperature.

21. A catalytic method for dealkylation of a phosphate ester or an ether, comprising contacting the phosphate ester or ether with a compound 5 comprising the general formula  $L\{YX_m\}_n$  wherein:

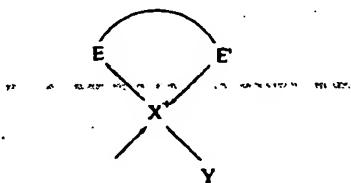
X is selected from the Group 13 elements consisting of boron, aluminum, gallium, indium, and tellurium;

Y is selected from the halide group consisting of fluorine, chlorine, bromine, iodine, and astatine;

10 L is a chelating ligand containing at least two molecules E and E' contacting the Group 13 element, the molecules E and E' being selected from the group consisting of C, N, O, and S; and

m and n are integers having a value of at least 1.

22. The method of claim 21, wherein the compound generates a cationic intermediate upon contacting the phosphate ester or ether, the cationic intermediate having the general formula:



23. The method of claim 21, wherein L is a Schiff base-containing ligand.

24. The method of claim 21, wherein L is a salen ligand.

25. The method of claim 24, wherein L is a bidentate ligand.

26. The method of claim 24, wherein L is a quadridentate ligand.

27. The method of claim 24, wherein L is selected from the group consisting of Salen ('Bu), Salpen ('Bu), Salben ('Bu), and Salhen ('Bu).

28. The method of claim 21, wherein Y is boron or aluminum.

29. The method of claim 21, wherein X is chlorine, bromine, or iodine.

30. The method of claim 21, wherein m and n are 2.

~~31~~ 32. The method of claim 21, wherein the reaction is conducted in the presence of  $BBr_3$ .

~~32~~ 33. The method of claim ~~32~~ 31, wherein the phosphate ester or ether and  $BBr_3$  are added in equimolar amounts.

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34. The method of claim 21, wherein the dealkylation is conducted at ambient temperature.